U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL WEATHER SERVICE
Silver Spring, Md. 20910

W/OS0321 - ACS

May 12, 1987

TO: All NWS Regional Headquarters, Area Electronics Supervisors, and Electronics Technicians (EHB-7 Distribution)

FROM: W/OS03 - J. Michael St. Clair

SUBJECT: Transmittal Memorandum for Engineering Handbook No. 7, Issuance 87-2

1. Material Transmitted:

Engineering Handbook No. 7, Communications Equipment, Section 3.4, Modification Note 23: NWR B220 Change from 2400 Hz Keying to VOX Keying with Transfer Inhibit.

2. Summary:

Modification Note 23 incorporates changes in the NWR B220 transmitter which changes the control from 2400 Hz keying to VOX keying with transfer inhibit.

3. Effect on Other Instructions:

Replacement pages for manual 7-424 are attached.

4. Certification Statement:

This modification has been successfully field tested at WSO Rochester, New York.

5. Reporting Modification to WSH Engineering Division:

Target date for completion of this modification is 30 days after receipt.

All completed equipment modifications shall be reported on the Form H-28, Engineering Progress Report, according to instructions contained in EHB-4, part 2, using equipment code B220.

COMMUNICATIONS EQUIPMENT MODIFICATION NO. 23
(For Electronics Technicians)

SUBJECT	: NWR 8220 Change from 2400 Hz Keying to VOX Keying with Transfer Inhibit.	
PURPOSE	: To upgrade the NWR B220 to interface with B420/B422 MAPS Control Console.	
EQUIPMENT AFFECTED	: NWR B220 Transmitters.	
PARTS REQUIRED	: 1 - K1 Subassembly	K10010SA
	1 ft. - White/Orange/Yellow Wire	W22934
	1 ft. - Gray Wire	W18888
	1 ft. - Heat Shrink Tubing	MT0502
	1 - Protective Shield	402014SA
	10 - Ty-raps	MT0701
	1 pr.- Slide Assembly	MP0210
	1 - SR-402RA Remote Unit	402960
	1 - W13 Cable Assembly	410510
	1 - Interface Assembly	410540
	1 - W17 Cable Assembly	410545
MOD DISTRIBUTION	: Modification kits will be shipped directly to NWR B220 transmitter stations by vendor.	
SPECIAL TOOLS	: Countersink Pin Pusher (P/N PM0010) - Supplied	
TEST EQUIPMENT	: Normal Station Complement	
TIME REQUIRED	: 4 Work Hours, 1 El Tech	

General:

This modification is being implemented within the NWR B220 Transmitter for interfacing with B420/B422 Control Consoles (MAPS).

Procedure:

A. Shut off transmitter and disconnect 220 VAC power.

1. Remove top blank panel and perforated panel from rear of unit.

2. Disconnect cable assembly from TB1 (on the rear of the remote unit) and J4 (on the exciter). Unplug the AC line cord, and remove phone lines from behind the SR402R Remote Unit. Remove the remote unit by removing four retaining screws.

3. Remove the screws securing the SR402 Exciter in the rack, and extend it on its slides. Remove the top cover.

4. Drill four holes in the upper right side panel of the exciter, per figure 1.

5. Remove the white/orange/yellow wire from T1-2, and connect it to K1-2. If the existing wire is not long enough, splice on the white/orange/yellow wire supplied, and cover the exposed wire with a piece of the supplied heat shrink tubing.

6. Remove the gray wire from T1-4 (208 VAC) or T1-5 (220-240 & 120 VAC) as required, and connect it to K1-7. If the existing wire is not long enough, splice on the piece of gray wire supplied, and cover the exposed wire with a piece of the supplied heat shrink tubing.

7. Mount K1 using the lower two holes drilled in step 4, with the black wire (ground wire) and spacer inside the rack and the lockwasher and nut outside the rack.

8. Connect the wires attached to K1 as follows:

a. Connect the white #18 wire (approx. 6 inches) to T1-4 or T1-5. This replaces the gray wire removed in step 6.

b. Insert the pin on the white/red #22 wire (approx. 2 feet) into J4-21 (rear panel).

c. Insert the pin of the white/black #22 wire (approx. 2 feet) into J4-20 (rear panel).

d. Attach the white/green #22 wire (approx. 2 feet) to existing white/green wire at J3-10 (rear panel).

e. Connect the white/black/yellow #22 wire (approx. 6 inches) to T1-2.

9. Mount the protective shield (P/N 402014SA) in the upper two holes drilled in step 4, and secure with hardware supplied.

10. Secure loose wires with supplied ty-raps (MT0701).

11. Reinstall the exciter top cover, slide it back into the rack, and secure it with the retaining screws.

12. Install the rack sections of the supplied slide assembly (P/N MP0210) in the equipment rack so that the SR-402RA Remote Unit will mount in the top position. Countersink fourth and fifth holes from top of rack on both sides, front & back. Assemble "L" bracket to rails the same way as on the exciter. Mount the rail assembly to rack using H10085 screws and the nut plates. Make sure unused hole of the nut plate is to the top and wide-spaced side toward outside of rack. Remove inner portion of rail assembly and mount to SR-402RA, using first and third holes on inner rail. Make sure mating sides remain mating. Top cover of SR-402RA has to be removed for mounting of rails. Leave top cover off unit until installed, cabled, and initial set up is complete.

13. Install the SR-402RA Remote Unit (equipped with the equipment sections of the slide assembly) in the equipment rack.

14. Connect cable P/N 410510 (supplied) W13P2 to J1 on Single Unit Interface Assembly and W13P1 to J4 on the exciter.

15. Reconnect phone line and install AC line cord from outlet strip located inside rack to J4 on rear of SR-402RA Remote Unit.

16. Replace rear panels.

B. Check the remote PC board (P/N 402970) located in the SR-402RA Remote Unit to ensure that the J4/P4 connection is made correctly for single unit operation (as a secondary, see figure 3).

C. Initial Setup

1. Perform Line Level Adjustment in accordance with section 4.4 of Addendum A377-4A (Jan 87)

2. Replace top cover of SR-402RA, and secure in rack with four retaining screws.

D. Manual Changes including:

The following pages are technical instructions for the SR-402RA Remote Control Unit and the Single Unit Interface Assembly 1A5. Please follow the below instructions for the correct placement of these changes.

1. Replacement Pages:

Replace pages 5-5/5-6, 10-7/10-8, 10-9/10-10, 10-11/10-12, and 10-13/10-14 in existing 7-424 instruction manual with new pages attached.

2. Additional Pages:

Addenda A377-4A and A377-4B are technical instructions for the SR-402RA Remote Control Unit and the Single Unit Interface Assembly 1A5. Discard obsolete addendum A377-4 (Oct 76) and replace with new addenda 9A377-4A and A377-4B in the back of your 7-424 instruction manual for safe keeping.

E. Disposition of Equipment: Dispose of replaced SR-402R Remote Control Unit locally.

This completes the modification.

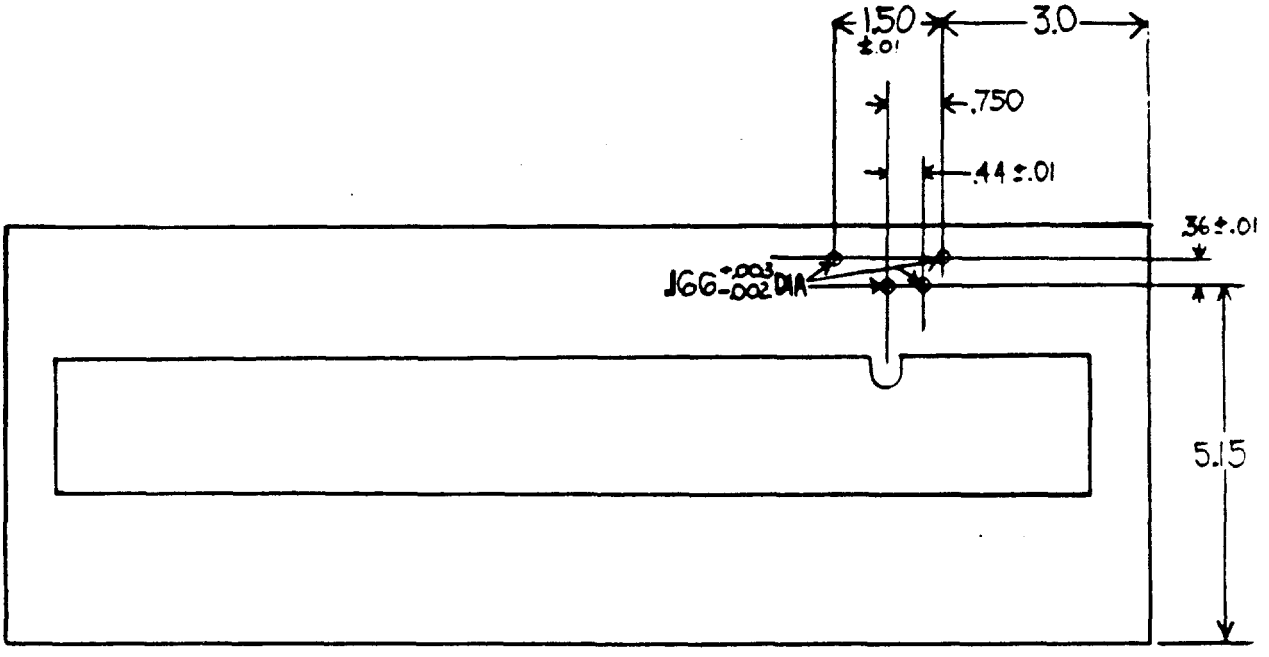


Figure 1. Exciter Chassis (Right Side)

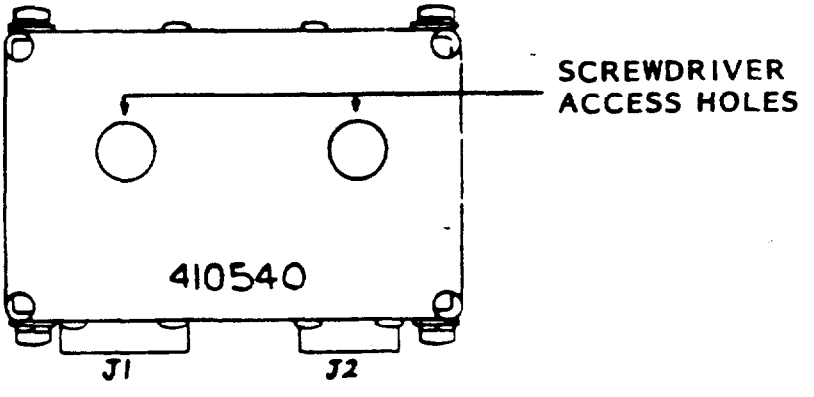


Figure 2. Single Unit Interface Assembly

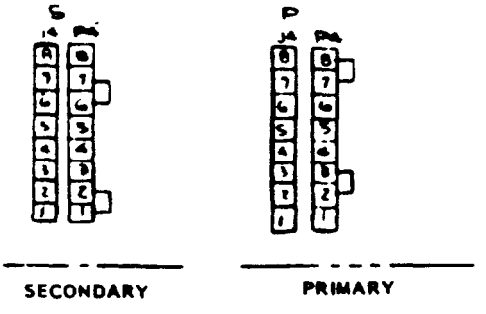


Figure 3. Remote PCB (J4/P4 Connections)

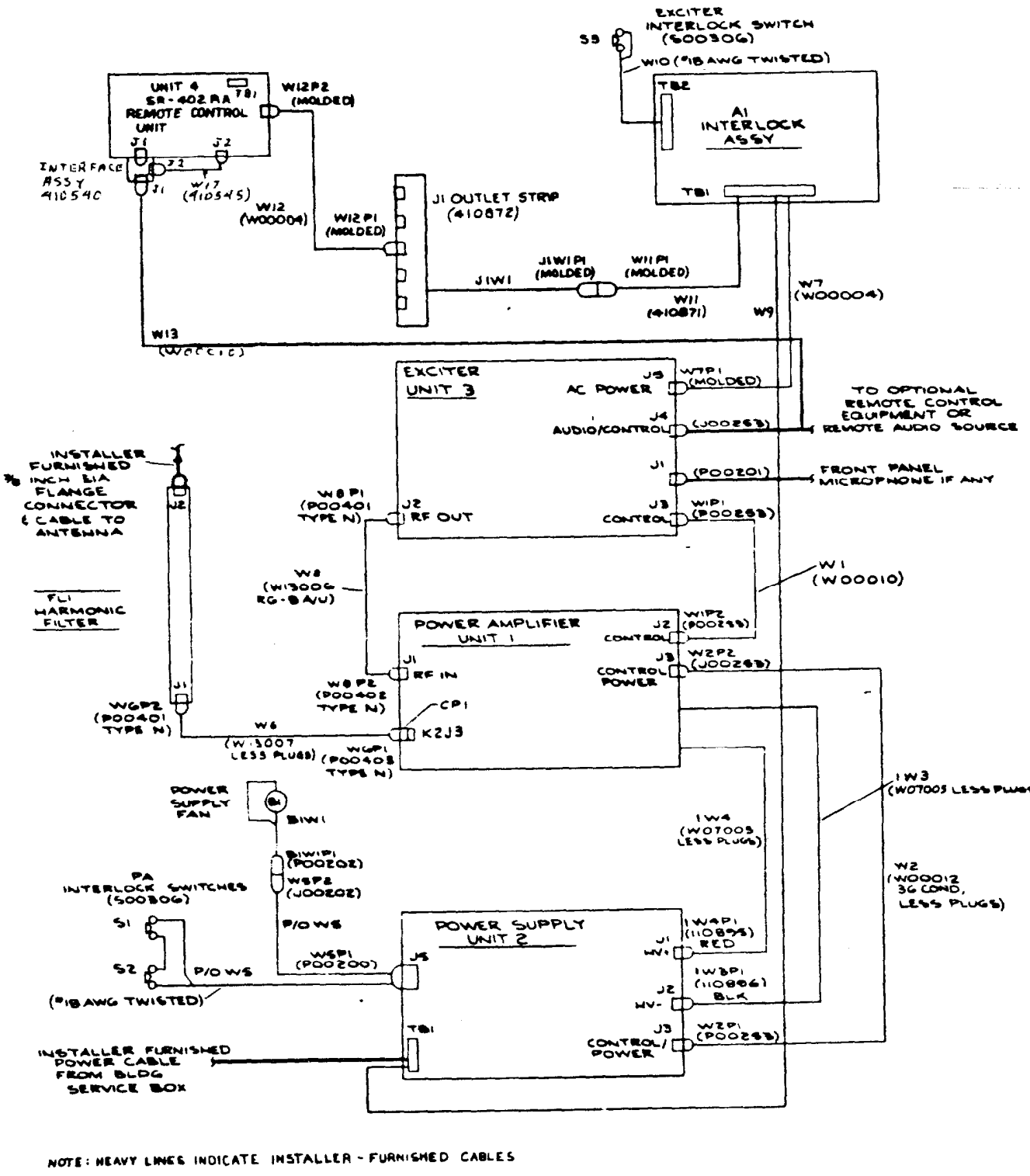


Figure 5-3. Transmitter, Cabling Diagram

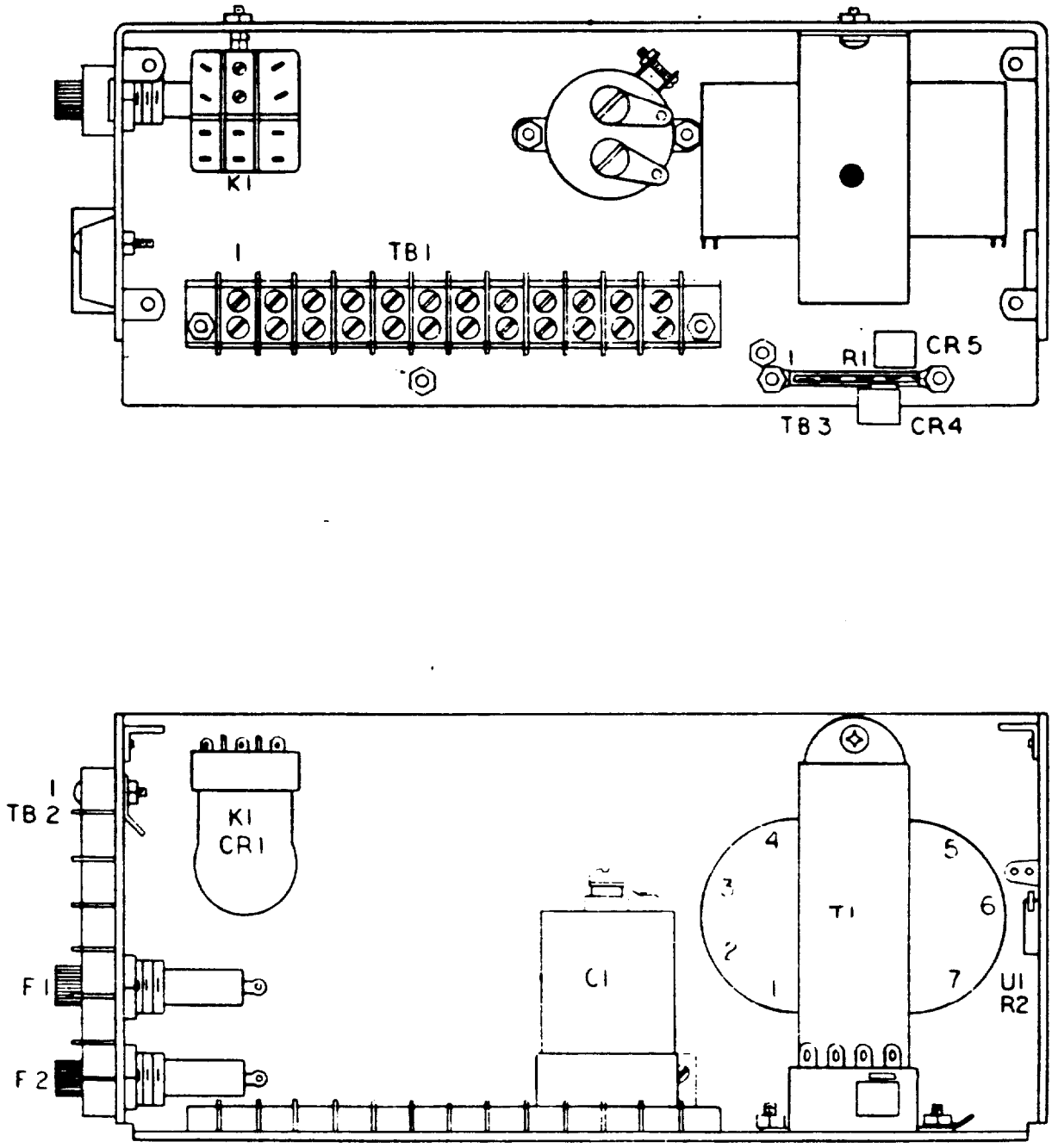


Figure 5-4. Interlock Assembly A1, Component Locations

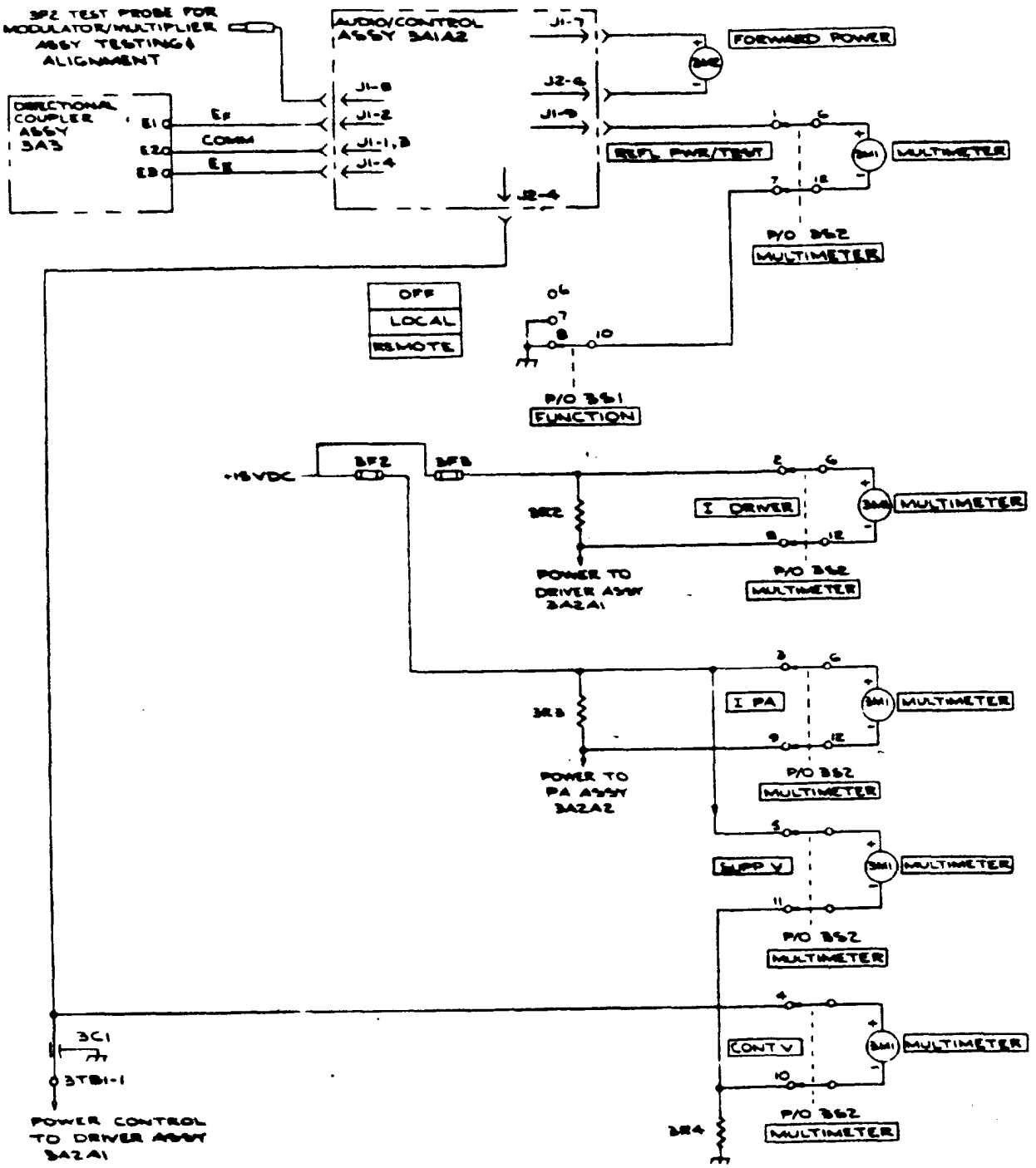
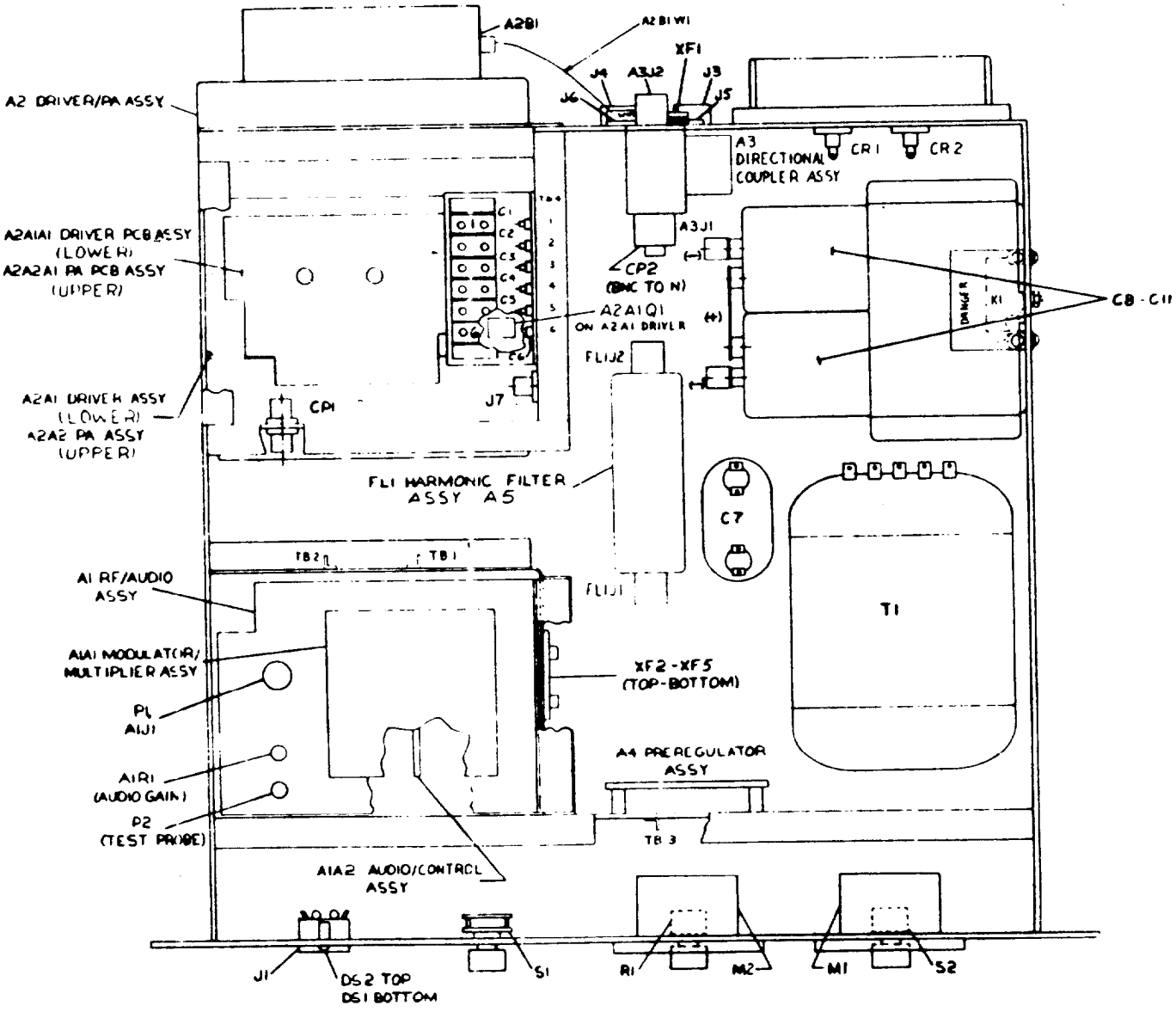


Figure 10-2. Meter Circuits, Simplified Schematic Diagram



Note: Procedure for adjusting audio gain control 3A1R1 is contained in Paragraph 4.13.

Figure 10-3. Exciter Unit Chassis, Component Locations

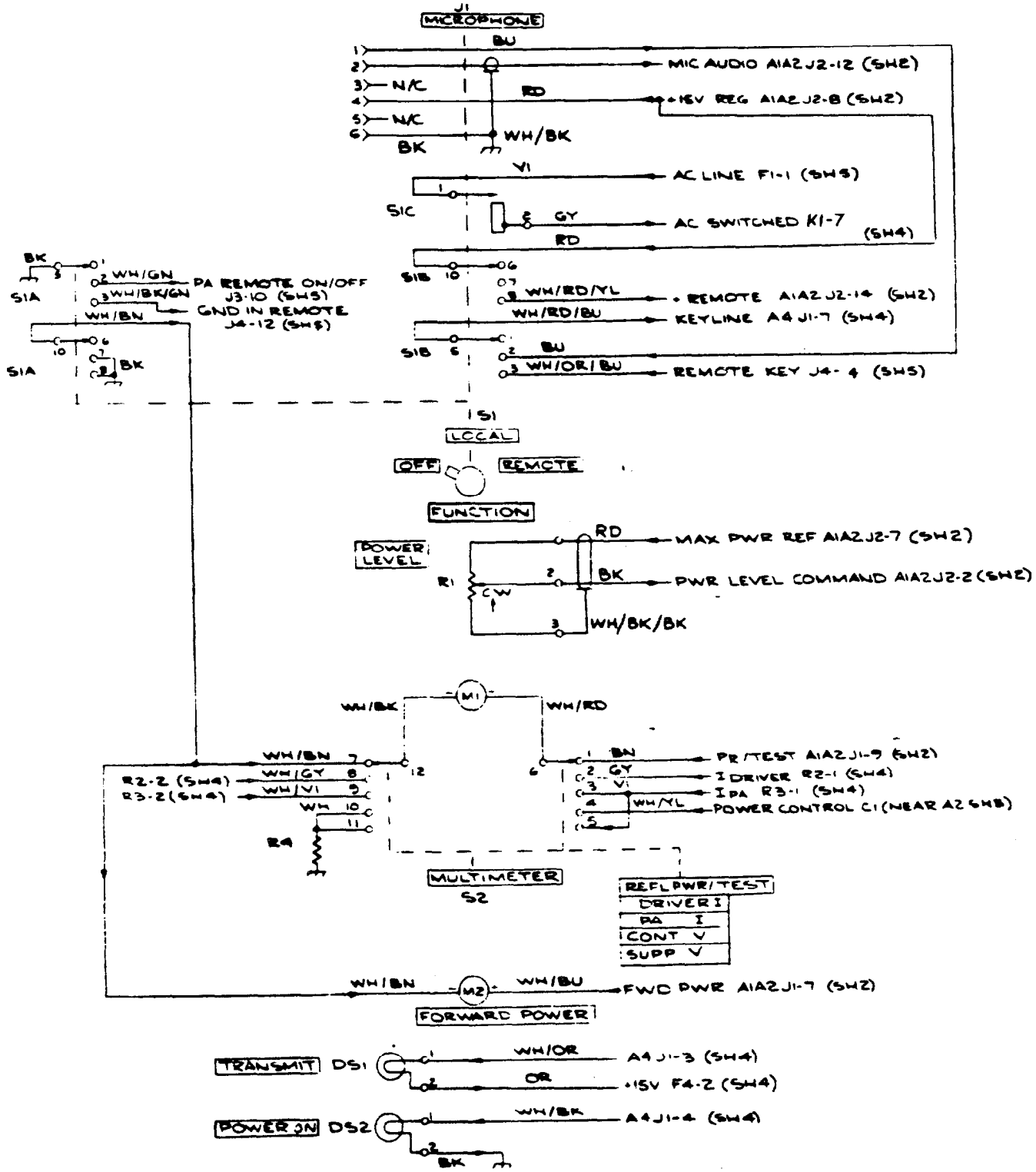


Figure 10-4. Exciter Unit, Schematic Diagram (Sheet 1 of 5)

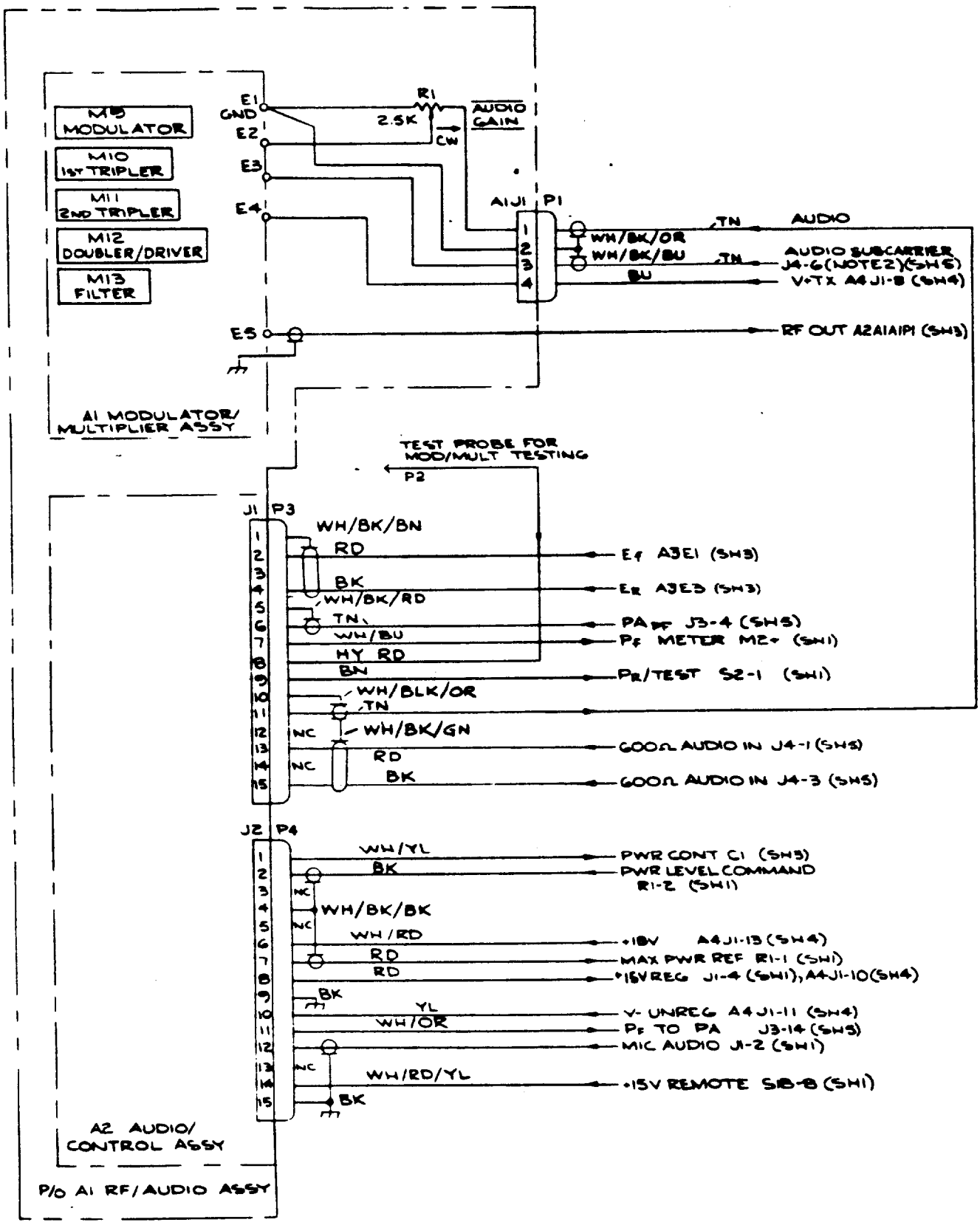


Figure 10-4. Exciter Unit, Schematic Diagram (Sheet 2 of 5)

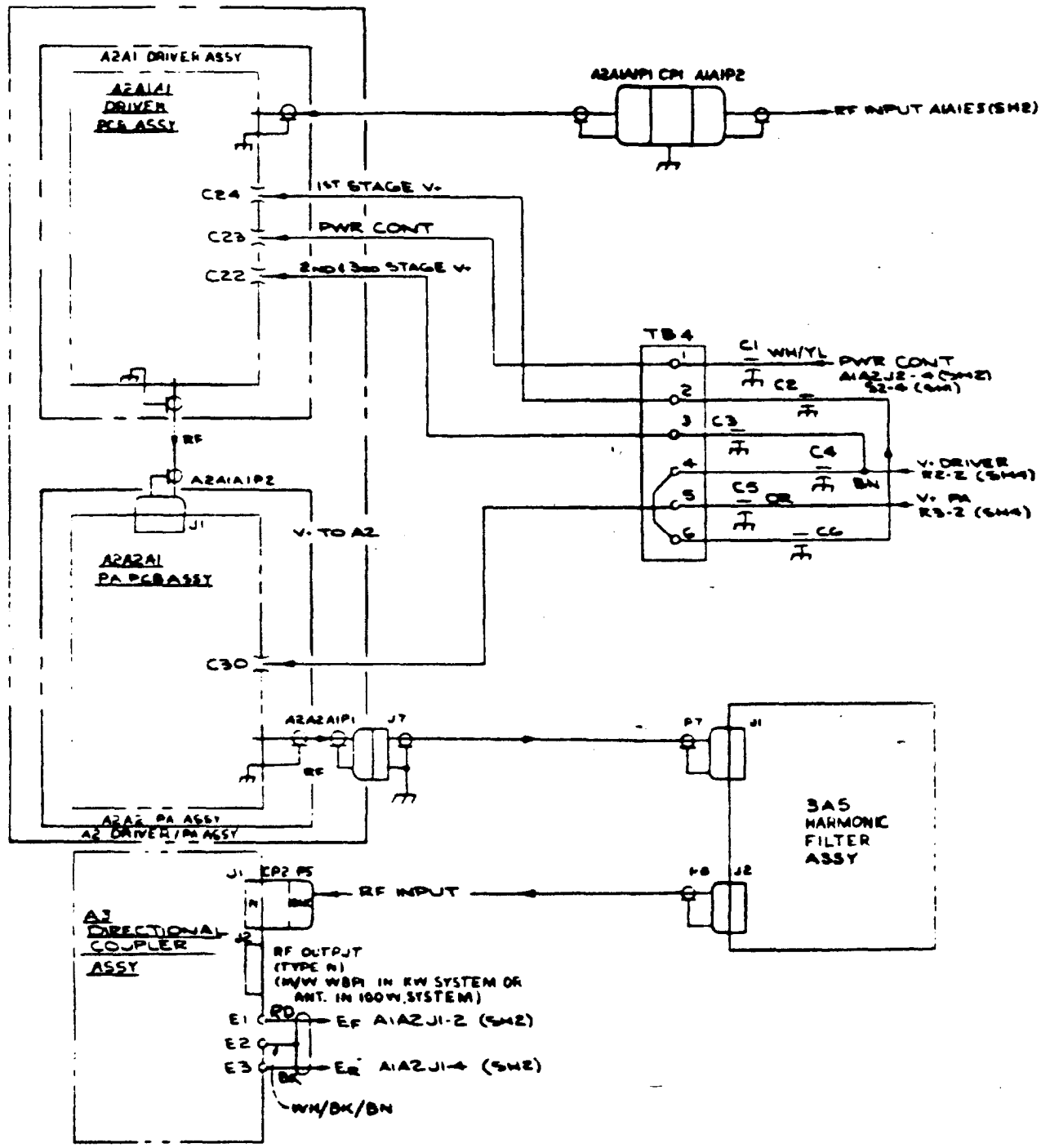


Figure 10-4. Exciter Unit, Schematic Diagram (Sheet 3 of 5)

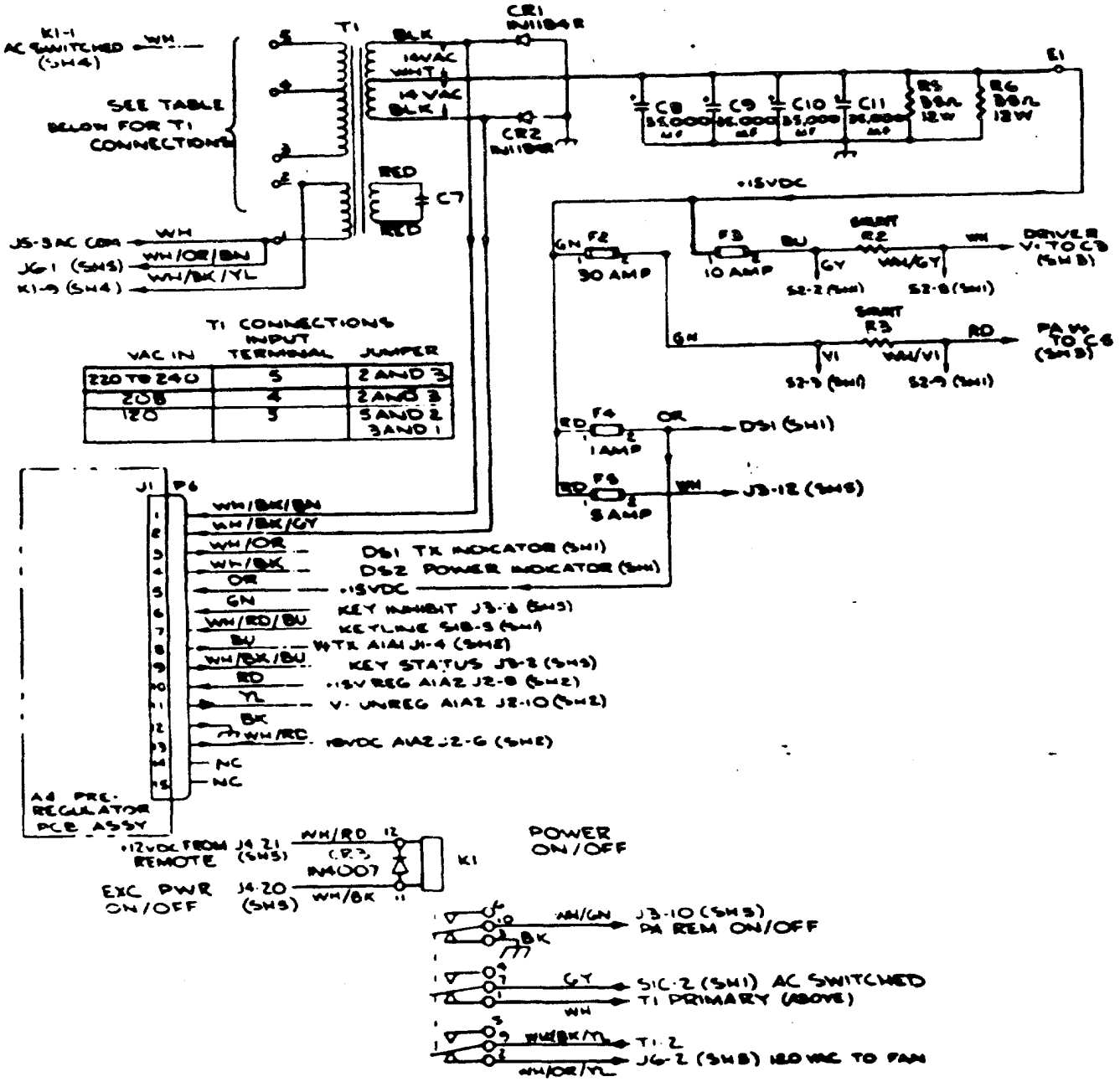


Figure 10-4. Exciter Unit, Schematic Diagram (Sheet 4 of 5)

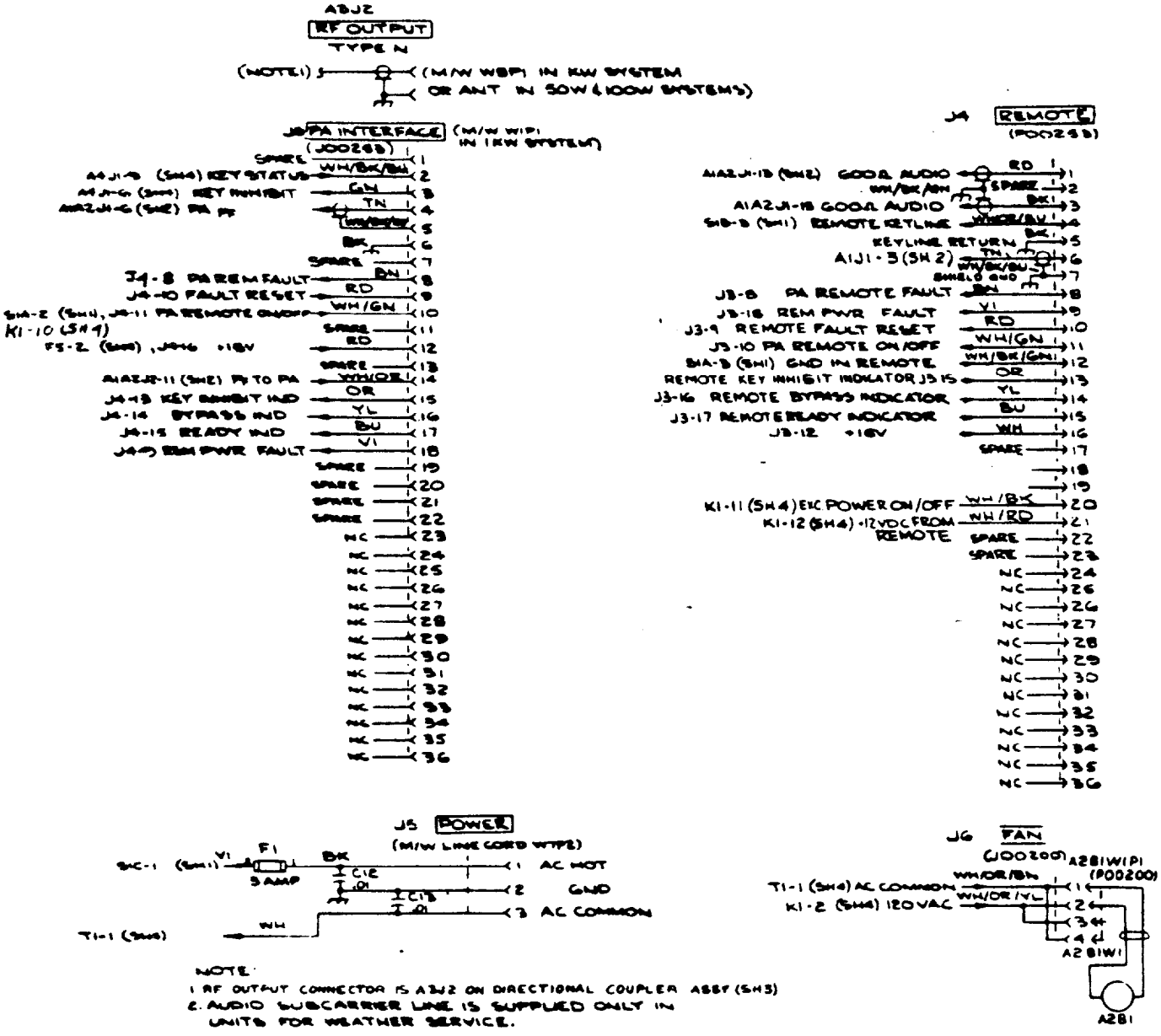


Figure 10-4. Exciter Unit, Schematic Diagram (Sheet 5 of 5)

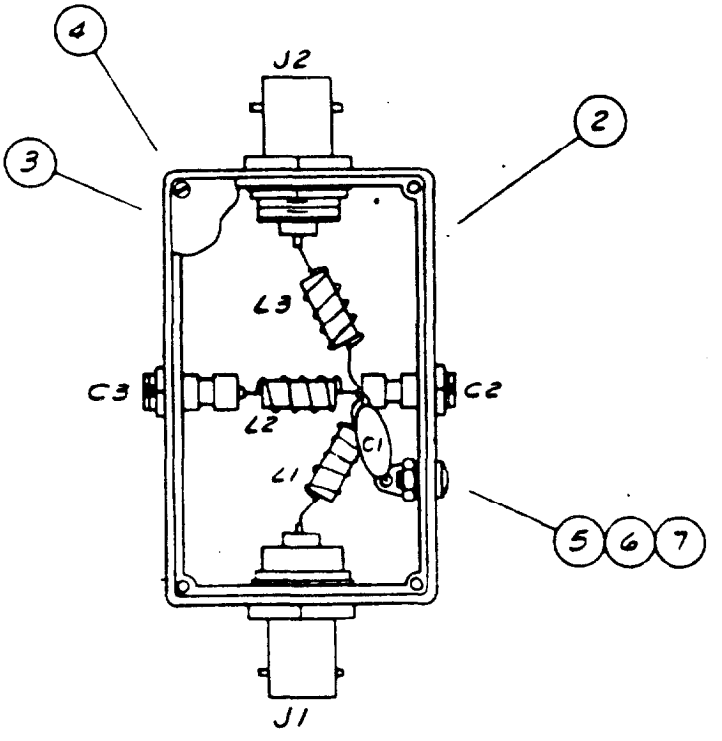


Figure 10-5. Harmonic Filter Assembly 3A5, Component Locations

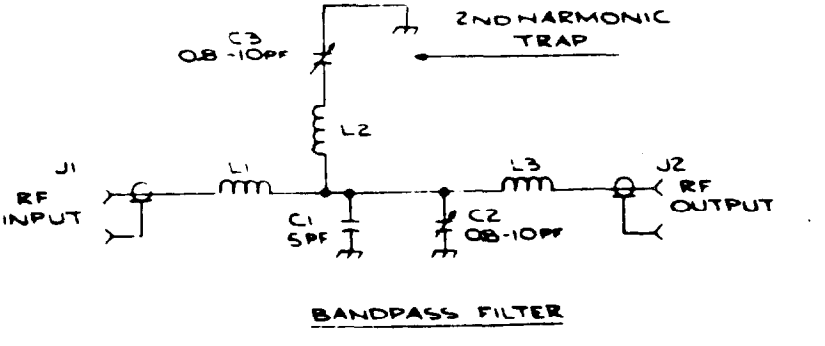


Figure 10-6. Harmonic Filter Assembly 3A5, Schematic Diagram

ADDENDUM

SR-402RA REMOTE CONTROL UNIT

1.0 GENERAL.

The SR-402RA Remote Control Unit provides an interface between a remote control signal and the SR-416 Transmitter. The unit is normally mounted in the uppermost pull-out chassis drawer of the SR-416D system cabinets. A local/remote mode selection switch is mounted on the exciter. In the local mode, the remote control unit does not operate. Audio information is fed via a 600Ω leased telephone line or UHF radio link.

The SR-402RA also monitors PA faults and indicates PA bypass by superimposing a beep tone on the audio to the exciter. When the beep is heard, the operator may switch to the secondary transmitter by a sequential tone sequence. An 1800 Hz tone followed by a 2400 Hz tone will cause a switch from the primary to secondary transmitter. A 2400 Hz tone followed by an 1800Hz tone will cause a switch from secondary to primary.

A special circuit will reset any fault indications during switchover. The entire control unit is mounted on a pc board. In the absense of voice a divide-by network will, after a predesignated time period (20 sec.), unkey the transmitter. Another feature is the key inhibit circuit, which will inhibit both transmitters while transfer occurs.

2.0 FUNCTIONAL DESCRIPTION.

Input information to the unit is in the form of a voice audio channel plus an 1800 Hz and a 2400 Hz control tone on a 600 Ω line. Outputs from the remote to the transmitter consist of: An audio channel to the exciter on a 600 Ω line which also carries the bypass tone alarm signal if activated; a line to the exciter which turns it and the PA on; a line to the exciter which keys the exciter; a line to the transfer box which transfers the antenna from one transmitter to the other; a line from the transfer box which indicates to both remotes which transmitter is coupled to the antenna; a line to the PA control board which resets (by means of a negative spike) the fault flip-flops on the board; and three lines from the PA control board that indicate the status of the power amplifier (fault condition *or* ready).

Outputs to the exciter are via J1; to the complimentary remote unit via J2; and to the transfer box via J3 which is only connected to the primary transmitter remote.

3.0 THEORY OF OPERATION.

3.1 General.

The remote control unit circuit is illustrated in detail in schematic diagram figure 1, and described as follows: Audio from the remote site is applied to TB1 and coupled to T1, then to the bandpass audio amplifier U1. It is then passed through T2 to the exciter 600Ω audio input Line. The level is adjusted by R3. The audio input is also diverted from the bandpass amplifier to the VOX amplifier, U4; the 1800 Hz bandpass filter; and the 2400 Hz bandpass filter.

The VOX bandpass amplifier amplifies the audio within the 300 to 1000 Hz range and converts it into positive pulses through the pulse amplifier which is then applied to U5, the VOX hang timer. In the presence of audio the timer is continually reset, but in the absence of audio the timer counts pulses from the clock U3C to a predetermined number set by a jumper on the board. The timer sets the voice presence flip-flop U6B, which turns off LED DS5 and also unkeys whichever transmitter is operating by disabling U15A and U15B.

The two bandpass filters, 1800 Hz and 2400 Hz, are coupled to an 1800 Hz and a 2400 Hz tone detector respectively. These are part of the tone sequence transmitter switching.

If a secondary transmitter is operating and it is desired to switch to the primary transmitter, a 2400 Hz tone is applied to the audio line. The 2400 Hz tone detector U10 is then activated which provides a positive pulse on the lock output, a negative pulse on the lock output which lights DS3, and after approximately 2 seconds, a negative pulse on the hang output which lights DS4.

The hang pulse is inverted and applied to 4 input NAND gate U13A. It also is differentiated by C38, R70 and applied to U13A. The lock pulse is also coupled into the gate; however, the 4th input is still "low" from U11D, which keeps Ul3A disabled,

Upon removal of the 2400 Hz tone, the lock and lock outputs return to their original state; however, the hang output remains "low" for approximately 2 seconds, keeping a "high" on U13A pin 4. When an 1800 Hz tone is applied to the audio line, the 1800 Hz tone detector follows the same sequence of events as the 2400 Hz detector. However, in 'this case the NAND gate U13B will receive 4 "highs" which will make its output momentarily "low", causing & input NAND gate U14B to go momentarily "high", setting tone sequence flip-flop U6A.

The "high" from U6A output terminal Q will be coupled through double inverters Q6 and Q7 and a "high" will go to the exciter relay K1 which will turn on the exciter and the power amplifier (K1 exciter N. C. contacts).

The Q output from U6A will trigger the transfer relay delay gate one-shot and the key inhibit delay gate one-shot via differentiator C40, R72. The transfer gate output is a negative pulse of 0.5 second width. The key inhibit gate output is a positive pulse of 1.0 second width. These two pulses are coupled to 2 input NAND gate U11A, and when both pulses are positive the U11A output goes negative for 0.5 second. This pulse is then inverted and NANDED with the "high" from U6A terminal Q output at U16B. The negative pulse output from U16B is then coupled through Q8 and Q9 to relay coil A1K1 in the antenna transfer

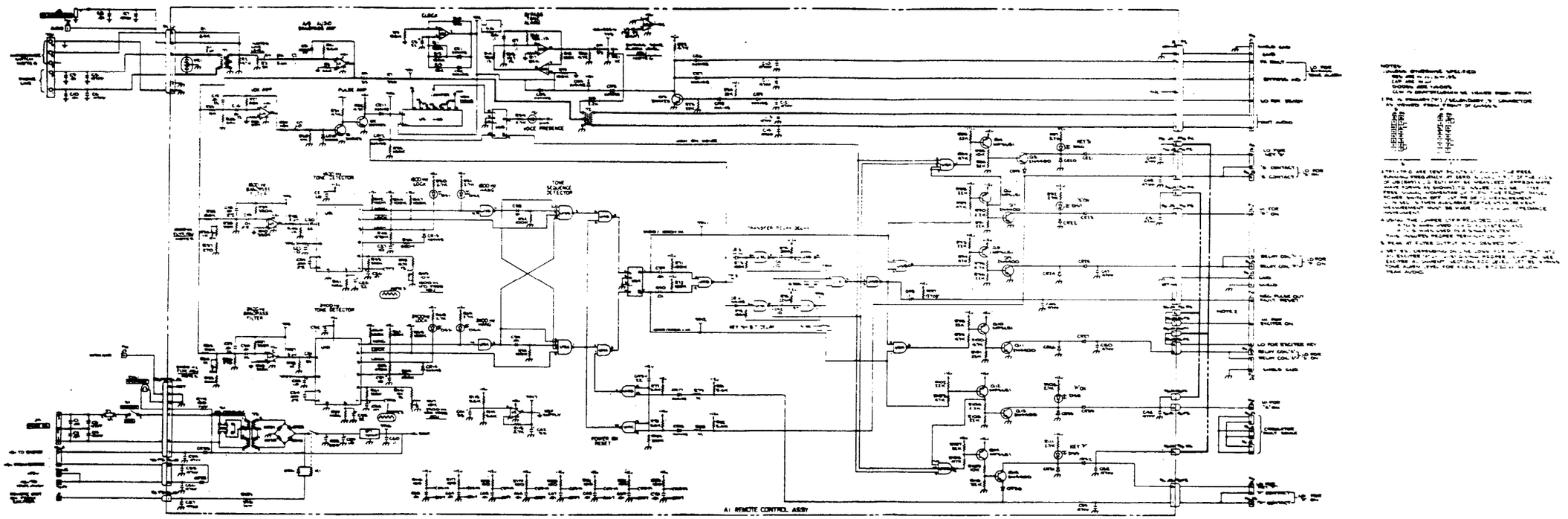


Figure 1. Remote Control Unit
Detailed Schematic Diagram

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assembly, which switches the antenna from the secondary to the primary transmitter.

The key inhibit gate also produces a negative pulse of 1 second width which is coupled to U15B 3 input NAND gate. The other two inputs to U15B go to tone sequence flip-flop U6A terminal $\overline{Q}$ via inverter Q12 and voice presence flip-flop U6B terminal $\overline{Q}$.

After a 1.0 second delay from the time the exciter is turned on, all three inputs to U15B are "high". The negative output from U15B is then coupled through Q14 and Q15 to the output and the exciter keyline which keys the primary transmitter and turns LED DS9 on.

This logic causes the transfer relay to be delayed by 0.5 second and the primary keyline to be delayed by 1.0 second from the time the primary exciter is turned on.

The positive spike generated from NAND gate U12D when switchover is made will also be coupled to the reset of the voice presence flip-flop U6B. This will ensure keying of the appropriate transmitter even before audio is received on the phone line.

The "P" contact from the transfer relay lA5AlKl is grounded after a "P" relay command from the remote. This grounds the emitter of Q15, which enables the "low" from 3 input NAND gate U15B to be coupled through to the primary exciter keyline. This enables only the transmitter that is coupled to the antenna to be keyed.

Whenever a transmitter switchover is made, pulses from the transfer relay delay and key inhibit delay gate are NANDED through U11A, inverted by U16D, and differentiated by C48 and R97. The resulting negative spikes are then applied to the remote fault reset on the PA control board, which resets fault latches to no-fault conditions.

The "S" contact is coupled to two input NAND gate U14C whose other input receives a positive pulse from differentiator C43/R124 when power is first turned on. This causes a "low" output from U14C only if the unit is powered on and the primary transmitter is coupled to the antenna. The "low" output from U14C is coupled to U14B and a positive pulse is applied to tone sequence flip-flop U6A's set input. This ensures that only the primary transmitter will be operating when the units are powered on and the primary transmitter is coupled to the antenna via the antenna transfer assembly.

3.2 Bypass Tone Alarm.

The remote control assembly Al bypass tone alarm circuit provides an audible alarm signal signifying power amplifier bypass. This circuit is described as follows: A "low" from the ready input of the PA control inhibits the bypass tone alarm by turning off Q3, which keeps a "high" on the non-inverting input to U3D. A "low" from the fault or bypass input of the PA control activates the bypass tone alarm by turning off CR5. This allows the clock to intermittently gate the tone alarm oscillator consisting of U3B and U3D. The tone is then coupled to audio output transformer T2 via the bypass tone alarm level adjust potentiometer R21.

3.3 SR-402RA PC Board LED's.

There are nine LED's on the remote control assembly pc board. Their reference designators and indicating functions are listed below:

LED DESIG	FUNCTION
DS1	1800 Hz Lock
DS2	1800 Hz Hang
DS2	2400 Hz Lock
DS4	2400 Hz Hang
DS5	Voice Presence
DS6	Key Secondary
DS7	Secondary on
DS8	Primary on
DS9	Key Primary

3.3.1 P C Board LED Sequence.

The following LED conditions will occur in this sequence when primary to secondary transfer takes place (1800 to 2400 Hz sequence):

SEQUENCE	CONDITION
1st	1800 Hz Lock LED turns on.
2nd	1800 Hz Hang LED turns on.
3rd	2400 Hz Lock LED turns on.
4th	2400 Hz Hang LED turns on. "S" on LED turns on, 1800 Hz Lock LED turns off, and the "P" on LED turns off.
5th	1800 Hz Hang LED turns off, the voice presence LED turns on, and the key "S" LED turns on.
6th	2400 Hz Lock LED turns off.
7th	2400 Hz Hang LED turns off.
8th	Voice presence and key "S" LED turn off after VOX delay time if audio stops coming in.

NOTE

The secondary to primary transfer sequence (2400 to 1800 Hz) is the opposite of the primary to secondary sequence (1800 to 2400 Hz).

3.4 Turn-off Sequence (Transmitters Switched).

The remote transmitter-switching sequence signal turns off the keyline, turns off power to the exciter and fan via K1, and turns off PS relay K3 which turns off on/off sense line putting the power amplifier in bypass mode. Blower times out and turns off parallel relay K2 (PS) which turns off all power to the power amplifier. Only the remote stays on.

3.5 Antenna Transfer Assembly Relay "S" to "P".

A "low" on P1-4, the secondary input, energizes the double contact relay A1K1 in the system antenna transfer assembly switching pc board Al. Relay A1K1 puts a ground on secondary contact output P1-6 and energizes coaxial relay K1 in the antenna transfer main assembly which feeds the output of the secondary transmitter to the antenna.

A "low" on P1-3, the primary input, energizes A1K1 in the other direction putting a ground on primary contact output P1-5 and de-energizing coaxial relay K1, which feeds the output of the primary transmitter to the antenna.

3.6 Power Supply.

The SR-402RA has its own internal power supply. The primary power required is 115 VAC applied to jack J4 at the rear of the unit. The 115V fuse is on the front panel. The 115V/230V switch S1 on the pc board must be' set to the appropriate position. The board derives 12V from a 3-terminal regulator under the pc board.

A 6V reference supply is also derived by U2, a 741 operational amplifier.

4.0 ADJUSTMENTS TO REMOTE SR-402RA.

4.1 General.

The primary and secondary remotes have jumpers on the pc board in connector P4, J4, that set each board respectively to control a primary or secondary transmitter. The jumper connections are illustrated in figure 2. The two remote units, primary and secondary, are paralleled via J2.

4.2 VOX Hang Time.

This is the time interval for the remote to unkey the exciter after audio is removed from the phone line or after the transmitters are switched by tone sequence. This adjustment is set at the factory. The adjustment is made by a jumper wire soldered on the pc board which couples the appropriate output of counter U5 to the set input of U6B, the voice presence flip-flop. The outputs are marked Xl, X2, X4, X8, X16, X32, X64 on the layout diagram. These numbers are multiplied by the clock period, which is approximately 4.5 seconds (e.g., X8 = 36 seconds).

4.3 Bypass Tone Alarm Adjustment.

The bypass tone alarm is set at the factory. Potentiometer R21 on the remote pc board adjusts the tone level output to the audio line into the exciter. This is set to produce 53 mVrms output to the exciter at J2-5, 7.

4.4 Line Level Adjustment.

Potentiometer R3 is located on the remote pc board with access provided through a hole in the front panel marked TRANSMIT LEVEL. R3 is adjusted relative to the amplitude of the audio on the phone line to provide a level of 180 mVrms output to the exciter at J2-5, 7.

4.5 1800 Hz Amplifier Adjustment (Factory Adjustment).

a. Connect an audio generator to the phone line input, TB1-1 & 2.

b. Connect a frequency counter also to the phone line input.

c. Connect an oscilloscope to TP5.

d. Connect an audio voltmeter to the audio output into the exciter at J2-5 & 7.

e. Set the audio generator to 1800 Hz on the frequency counter and increase the amplitude to give a reading of 180 mVrms on-the audio voltmeter.

f. Vary the frequency of the audio generator to find the peak indication on the oscilloscope. If it is off 1800 Hz by more

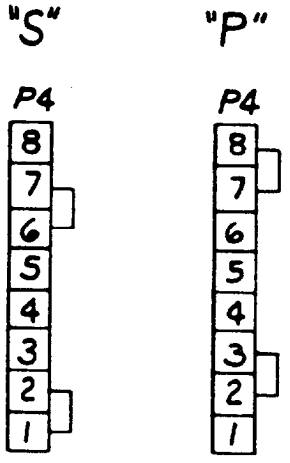

Figure 2. Primary/Secondary Connector, Jumper Connections

than ± 5 Hz, adjust R36 on the remote pc board to give a peak signal indication on the oscilloscope while the audio generator is set at 1800 Hz.

4.6 1800 Hz Tone Detector Adjustment (Factory Adjustment).

a. Connect a frequency counter to TP7 on the pc board.

b. Temporarily connect a clip lead between TP6 and U8 pin 2.

c. Observe the frequency of the counter. If it is off 1800 Hz by more than ± 5 Hz, adjust R49 on the pc board for an 1800 Hz reading on the counter.

4.7 2400 Hz Amplifier Adjustment LFactory Adjustment).

a. Connect an audio generator to the phone line input TBl-1 & 2.

b. Connect a frequency counter also to the phone line input.

c. Connect an oscilloscope to TP8.

d. Connect an audio voltmeter to the audio output into the exciter at J2-5 & 7.

e. Set the audio generator to 2400 Hz on the frequency counter and increase the amplitude to give a reading of 180 mVrms on the audio voltmeter.

f. Vary the frequency of the audio generator to find the peak indication on the oscilloscope. If it is off 2400 Hz by more than ± 5 Hz, adjust R54 on the pc board to give a peak indication of signal on the oscilloscope while the audio generator is set at 2400 Hz.

4.8 2400 Hz Tone Detector Adjustment (Factory Adjustment).

a. Connect a frequency counter to TP10 on the pc board.

b. Temporarily connect a clip lead between TP9 and U10 pin 2.

c. Observe the frequency of the counter. If it is off 2400 Hz by more than + 5 Hz, adjust R67 on the pc board for a 2400 Hz reading on the counter.

5.0 TROUBLESHOOTING.

Typical voltage measurements are given in table 1 for aid in troubleshooting this unit.

6.0 COMPONENT LOCATIONS AND PARTS LISTS.

The component locations for the SR-402RA remote control unit are shown in figure 3. The component locations for the remote control pc board assembly are shown in figure 4. The parts lists follow at the end.

Table 1. Typical DC Voltage Measurements (SR-402RA)

PIN	U9	U10	U11	U12	U13	U14	U15	U16	U17
1	0.02V	11.7 V	0.0 V	11.6 V	1.7 V	11.7 V	11.7 V	0.05V	B
2	5.92V	5.92V	11.7 V	11.6 V	0.0 V	11.7 V	0.0 V	0.0 V	22.6 V
3	5.79V	0.18V	11.7 V	0.0 V	0.0 V	0.0 V	0.0 V	11.7 V	
4	0.0 V	0.0 V	11.7 V	0.0 V	0.0 V	0.0 V	11.7 V	11.7 V	
5	0.02V	11.6 V	0.0 V	11.6 V	0.02V	11.7 V	0.0 V	0.0 V	E
6	5.92V	0.02V	0.0 V	11.6 V	0.0 V	11.7 V	0.0 V	11.7 V	11.7 V
7	11.7 V	11.6 V	0.0 V	0.0 V	0.0 V	0.0 V	0.0 V	0.0 V	
8	0.0 V	9.64V	11.7 V	11.7 V	11.7 V	11.7 V	11.7 V	11.7 V	
9	---	9.64V	11.6 V	11.6 V	11.7 V	11.7 V	11.7 V	11.7 V	
10	---	5.24V	11.6 V	11.6 V	0.0 V	0.0 V	11.6 V	11.7 V	GND
11	---	2.35V	0.0 V	0.0 V	0.0 V	11.7 V	11.6 V	0.0 V	---
12	---	5.22V	0.0 V	11.7 V	0.0 V	11.7 V	11.7 V	11.7 V	---
13	---	11.7 V	11.5 V	0.0 V	0.02V	0.0 V	0.0 V	0.0 V	---
14	---	11.2 V	11.5 V	0.0 V	0.0 V	11.7 V	0.0 V	0.0 V	---

TEST POINT	VOLTAGE
1	0.0
2	2.0-11.0
3	0.0
4	0.0
5	5.92
6	5.2

TEST POINT	VOLTAGE
7	0.6-3.8
8	5.92
9	5.22
10	2.36
11	11.7
12	0.05

TEST POINT	VOLTAGE
13	0.0
14	11.7
15	0.0
16	11.7
17	5.92

Table 1. Typical DC Voltage Measurements (SR-402A) (continued)

NOTE: The following conditions existed during the measurement period: 115 VAC applied; no external connections to the SR-402RA; measurements made with Fluke 8000A DVM.

PIN	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
E	GND	GND	GND	11.7	0.07	11.7	GND	11.7
B	0.0	0.7	0.7	11.7	0.0	11.7	0.0	11.7
C	0.7	0.07	0.05	0.0	10.46	0.0	10.5	0.0

PIN	Q9	Q10	Q11	Q12	Q13	Q14	Q15
E	GND	11.7	GND	11.7	GND	11.7	0.03
B	0.0	11.7	0.0	11.0	0.74	11.7	0.0
C	0.02	0.0	0.06	11.6	0.0	0.0	10.5

Table 1. Typical DC Voltage Measurements (SR402RA) (continued)

PIN	U1	U2	U3	U4	U5	U6	U7	U8
1	0.0	0.0	11.12	0.0	2.1-11.0	11.7	0.0	11.7
2	5.92	5.92	0.0	5.92	0.0	0.05	5.9	5.9
3	5.88	5.92	10.52	5.87	0.0	0.0	5.7	0.20
4	0.0	0.0	11.7	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	3.3-9.3	0.0	11.7	0.0	0.0	11.6
6	5.92	5.92	3.8-9.2	5.92	11.7	0.0	5.92	0.02
7	11.7	11.7	2.0-10.0	11.7	0.0	0.0	11.7	11.6
8	0.0	0.0	5.92	0.0	11.7	11.7	0.0	9.63
9	---	---	5.92	---	0.0	11.7	---	9.63
10	---	---	5.87	---	11.7	0.0	---	5.23
11	---	---	0.0	---	11.7	0.0	---	0.6-4.5
12	---	---	5.8-10.5	---	0.0	0.0	---	5.2
13	---	---	5.85	---	11.7	0.0	---	0.0
14	---	---	6.5-10.9	---	0.0	0.0	---	11.2

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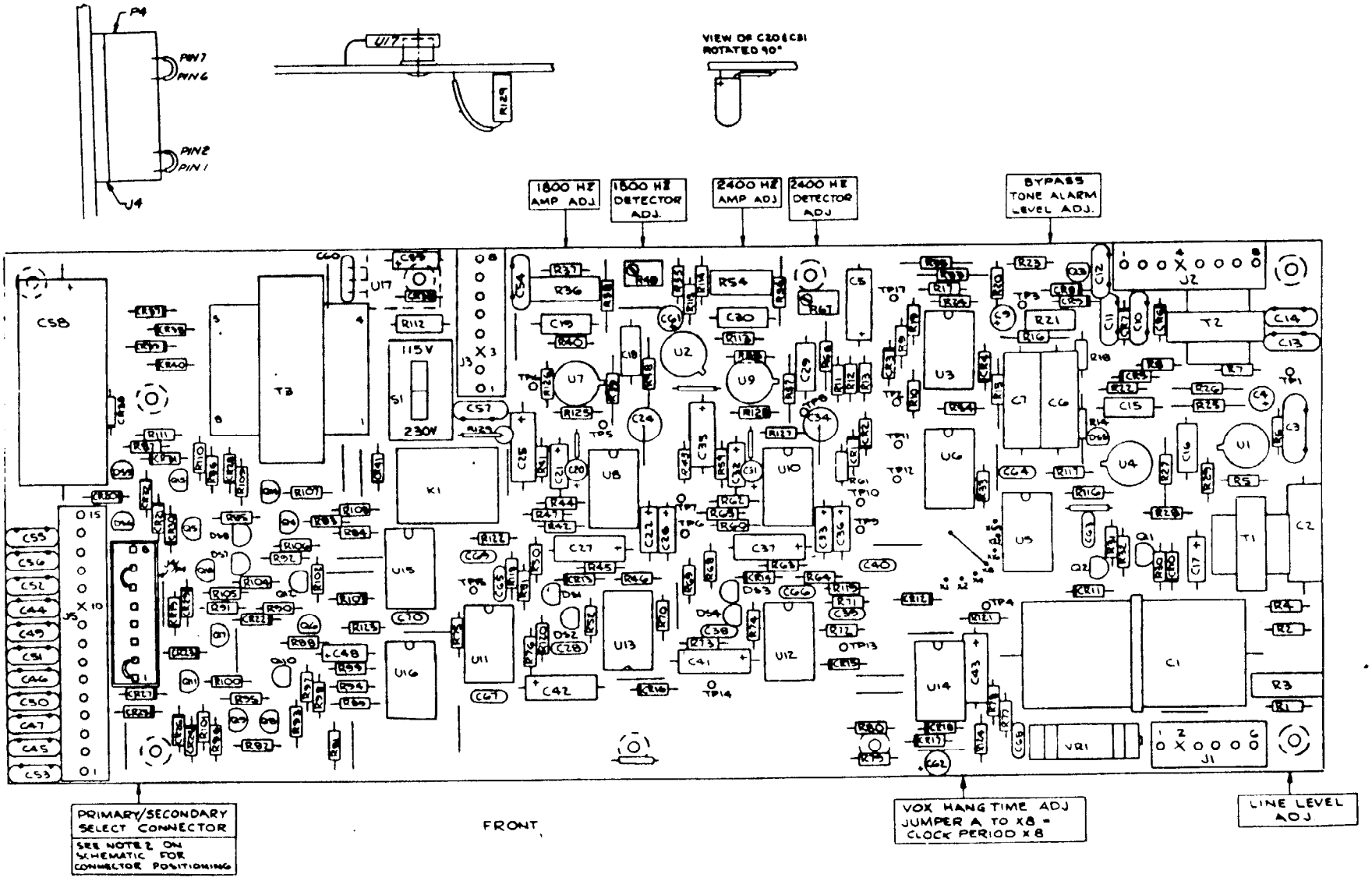

Figure 4. Remote Control PC Board Assembly Al, Component Locations

REMOTE CONTROL UNIT

REF DESIG	DESCRIPTION	P/N
- -	REMOTE CONTROL UNIT SR-402RA	402960
A1	Remote Control PC Board Assembly	402970
C1	Cap, cer, .01 uF, 1.6 kV	C00001
C2	Cap, cer, .01 uF, 1.6 kV	C00001
C3	Cap, mica, 47 pF, 5%, 500V	C05470
C4	Cap, mica, 47 pF, 5%, 500V	C05470
C5	Cap, mica, 47 pF, 5%, 500V	C05470
C6	Cap, mica, 47 pF, 5%, 500V	C05470
C7	Cap, mica, 47 pF, 5%, 500V	C05470
C8	Cap, cer, .01 uF, 500V	C10100
C9	Cap, cer, .01 uF, 500V	C10100
C10	Cap, cer, .01 uF, 500V	C10100
F1	Fuse, 3AG, std blo, 1 amp	F10100
DS1	Lamp & socket	X00501
J1	Connector, 36 pin	J00253
J2	Connector, 23 pin	J00257
J3	Connector, 14 pin	J00258
J4	Receptacle, AC power	J00203
J5	Jack	J00120
P1	Plug, molex, 6 pin	P00216
P2	Plug, molex, 8 pin	P00210
P3	Plug, molex, 8 pin	P00210
P4	Not used	- - -
P5	Plug, molex, 15 pin	P00212
S1	Switch	S00311
TB1	Terminal strip	TB0005
W1	Line Cord	W00004
XF1	Fuse holder	X00400

REMOTE CONTROL PCB ASSEMBLY

REF DESIG	DESCRIPTION	P/N
- -	REMOTE CONTROL PCB ASSEMBLY	402970
C1	Cap, mylar, 2 uF, 10%, 100V	C20002
C2	Cap, mylar, .1 uF, 10%, 100V	C20100
C3	Cap, mica, 1000 pF, 5%, 500V	C06102
C4	Cap, tant, 33 uF, 10%, 10V	C43362
C5	Cap, tant, 22 uF, 10%, 15V	C42263
C6	Cap, pc, .1 uF, 2%, 100V	C30007
C7	Cap, pc, .1 uF, 2%, 100V	C30007
C8	Not used	- - -
C9	Cap, tant, 33 uF, 10%, 10V	C43362
C10	Cap, mica, 47 pF, 5%, 500V	C05470
C11	Cap, mica, 47 pF, 5%, 500V	C05470
C12	Cap, mica, 47 pF, 5%, 500V	C05470
C13	Cap, mica, 47 pF, 5%, 500V	C05470
C14	Cap, mica, 47 pF, 5%, 500V	C05470
C15	Cap, pc, .01 uF, 2%, 100V	C30013
C16	Cap, pc, .01 uF, 2%, 100V	C30013
C17	Cap, tant, 1 uF, 10%, 35V	C41056
C18	Cap, pc, .01 uF, 2%, 100V	C30013
C19	Cap, pc, .01 uF, 2%, 100V	C30013
C20	Cap, tant, 33 uF, 10%, 10V	C43362
C21	Cap, tant, 1 uF, 10%, 35V	C41056
C22	Cap, tant, 1 uF, 10%, 35V	C41056
C23	Not used	- - -
C24	Cap, pc, .024 uF, 2%, 100V	C30015
C25	Cap, tant, 22 uF, 10%, 15V	C42263
C26	Cap, tant, .47 uF, 10%, 35V	C44746
C27	Cap, tant, 10 uF, 10%, 20V	C41064
C28	Cap, cer, .01 uF, 20%, 50V	C10101
C29	Cap, pc, .01 uF, 2%, 100V	C30013
C30	Cap, pc, .01 uF, 2%, 100V	C30013
C31	Cap, tant, 33 uF, 10%, 10V	C43362
C32	Cap, tant, 1 uF, 10%, 35V	C41056
C33	Cap, tant, 1 uF, 10%, 35V	C41056
C34	Cap, pc, .024 uF, 2%, 100V	C30015
C35	Cap, tant, 22 uF, 10%, 15V	C42263
C36	Cap, tant, .47 uF, 10%, 35V	C44746
C37	Cap, tant, 10 uF, 10%, 20V	C41064
C38	Cap, cer, .01 uF, 20%, 50V	C10101
C39	Cap, cer, .01 uF, 20%, 50V	C10101
C40	Cap, cer, .01 uF, 20%, 50V	C10101
C41	Cap, tant, 10 uF, 10%, 20V	C41064
C42	Cap, tant, 10 uF, 10%, 20V	C41064
C43	Cap, tant, 22 uF, 10%, 15V	C42263
C44	Cap, mica, 47 pF, 5%, 500V	C05470
C45	Cap, mica, 47 pF, 5%, 500V	C05470
C46	Cap, mica, 47 pF, 5%, 500V	C05470
C47	Cap, mica, 47 pF, 5%, 500V	C05470
C48	Cap, tant, .1 uF, 20%, 35V	C41046
C49	Cap, mica, 47 pF, 5%, 500V	C05470
C50	Cap, mica, 47 pF, 5%, 500V	C05470
C51	Cap, mica, 47 pF, 5%, 500V	C05470

REMOTE CONTROL PCB ASSEMBLY (Continued)

REF DESIG	DESCRIPTION	P/N
C52	Cap, mica, 47 pF, 5%, 500V	C05470
C53	Cap, mica, 47 pF, 5%, 500V	C05470
C54	Cap, mica, 47 pF, 5%, 500V	C05470
C55	Cap, mica, 47 pF, 5%, 500V	C05470
C56	Cap, mica, 47 pF, 5%, 500V	C05470
C57	Cap, mica, 47 pF, 5%, 500V	C05470
C58	Cap, elect, 500 uF, 50V	C70003
C59	Cap, tant, 1 uF, 10%, 35V	C41056
C60	Cap, cer, .1 uF, +80-20%, 25V	C11000
C61	Cap, tant, 33 uF, 10%, 10V	C43362
C62	Cap, tant, 33 uF, 10%, 10V	C43362
C63	Cap, cer, .01 uF, 20%, 50V	C10101
C64	Cap, cer, .01 uF, 20%, 50V	C10101
C65	Cap, cer, .01 uF, 20%, 50V	C10101
C66	Cap, cer, .01 uF, 20%, 50V	C10101
C67	Cap, cer, .01 uF, 20%, 50V	C10101
C68	Cap, cer, .01 uF, 20%, 50V	C10101
C69	Cap, cer, .01 uF, 20%, 50V	C10101
C70	Cap, cer, .01 uF, 20%, 50V	C10101
CR1	Diode, si, 1N4148	CR4148
CR2	Diode, si, 1N4148	CR4148
CR3	Diode, si, 1N4148	CR4148
CR4	Diode, si, 1N4148	CR4148
CR5	Diode, si, 1N4148	CR4148
CR6	Diode, si, 1N4148	CR4148
CR7	Diode, si, 1N4148	CR4148
CR8	Diode, si, 1N4148	CR4148
CR9	Diode, si, 1N4148	CR4148
CR10	Diode, si, 1N4148	CR4148
CR11	Diode, si, 1N4148	CR4148
CR12	Diode, si, 1N4148	CR4148
CR13	Diode, si, 1N4148	CR4148
CR14	Diode, si, 1N4148	CR4148
CR15	Diode, si, 1N4148	CR4148
CR16	Diode, si, 1N4148	CR4148
CR17	Diode, si, 1N4148	CR4148
CR18	Diode, si, 1N4148	CR4148
CR19	Diode, rect, 200V, 1A, 1N4003	CR4003
CR20	Diode, rect, 200V, 1A, 1N4003	CR4003
CR21	Diode, rect, 200V, 1A, 1N4003	CR4003
CR22	Diode, rect, 200V, 1A, 1N4003	CR4003
CR23	Diode, rect, 200V, 1A, 1N4003	CR4003
CR24	Diode, rect, 200V, 1A, 1N4003	CR4003
CR25	Diode, rect, 200V, 1A, 1N4003	CR4003
CR26	Diode, rect, 200V, 1A, 1N4003	CR4003
CR27	Diode, rect, 200V, 1A, 1N4003	CR4003
CR28	Diode, rect, 200V, 1A, 1N4003	CR4003
CR29	Diode, rect, 200V, 1A, 1N4003	CR4003
CR30	Diode, rect, 200V, 1A, 1N4003	CR4003
CR31	Diode, rect, 200V, 1A, 1N4003	CR4003
CR32	Diode, rect, 200V, 1A, 1N4003	CR4003
CR33	Diode, rect, 200V, 1A, 1N4003	CR4003

REMOTE CONTROL PCB ASSEMBLY (Continued)

REF DESIG	DESCRIPTION	P/N
CR34	Not used	- - -
CR35	Diode, rect, 200V, 1A, 1N4003	CR4003
CR36	Not used	- - -
CR37	Diode, rect, 200V, 1A, 1N4003	CR4003
CR38	Diode, rect, 200V, 1A, 1N4003	CR4003
CR39	Diode, rect, 200V, 1A, 1N4003	CR4003
CR40	Diode, rect, 200V, 1A, 1N4003	CR4003
CR41	Diode, rect, 200V, 1A, 1N4003	CR4003
DS1	Lamp, LED, red, MV5053	DS1004
DS2	Lamp, LED, red, MV5053	DS1004
DS3	Lamp, LED, red, MV5053	DS1004
DS4	Lamp, LED, red, MV5053	DS1004
DS5	Lamp, LED, red, MV5053	DS1004
DS6	Lamp, LED, red, MV5053	DS1004
DS7	Lamp, LED, red, MV5053	DS1004
DS8	Lamp, LED, red, MV5053	DS1004
DS9	Lamp, LED, red, MV5053	DS1004
J1	Recept, 6 pin, m, pc	J00216
J2	Recept, 8 pin, m, pc	J00210
J3	Recept, 8 pin, m, pc	J00210
J4	Recept, 8 pin, m, pc	J00210
J5	Recept, 15 pin, m, pc	J00212
K1	Relay, spdt, 12 Vdc	K10016
P1	Not used	- - -
P2	Not used	- - -
P3	Not used	- - -
P4	Plug, 8 socket contacts	P00210
Q1	Xstr, npn, 2N4123	Q41230
Q2	Xstr, npn, 2N4123	Q41230
Q3	Xstr, npn, 2N4123	Q41230
Q4	Xstr, pnp, MPS-L51	Q00007
Q5	Xstr, npn, 2N4400	Q44000
Q6	Xstr, pnp, MPS-L51	Q00007
Q7	Xstr, npn, 2N4400	Q44000
Q8	Xstr, pnp, MPS-L51	Q00007
Q9	Xstr, npn, 2N4400	Q44000
Q10	Xstr, pnp, MPS-L51	Q00007
Q11	Xstr, npn, 2N4400	Q44000
Q12	Xstr, pnp, MPS-L51	Q00007
Q13	Xstr, npn, 2N4400	Q44000
Q14	Xstr, pnp, MPS-L51	Q00007
Q15	Xstr, npn, 2N4400	Q44000
R1	Res, cc, 2.4K, 5%, 1/4W	R25242
R2	Res, cc, 4.7K, 5%, 1/4W	R20472
R3	Pot, trim, pc, 5K	R88502
R4	Res, cc, 5.6K, 5%, 1/4W	R20562
R5	Res, cc, 56K, 5%, 1/4W	R20563

REMOTE CONTROL PCB ASSEMBLY (Continued)

REF DESIG	DESCRIPTION	P/N
R6	Res, cc, 56K, 5%, 1/4W	R20563
R7	Res, cc, 330 ohm, 5%, 1/4W	R20331
R8	Res, cc, 2.2K, 5%, 1/4W	R20222
R9	Res, cc, 100K, 5%, 1/4W	R20104
R10	Res, cc, 47K, 5%, 1/4W	R20473
R11	Res, cc, 150K, 5%, 1/4W	R20154
R12	Res, cc, 150K, 5%, 1/4W	R20154
R13	Res, cc, 10K, 5%, 1/4W	R20103
R14	Res, metal film, 75K, 1%, 1/8W	R17502
R15	Res, metal film, 187 ohm, 1%, 1/8W	R11870
R16	Res, metal film, 75K, 1%, 1/8W	R17502
R17	Res, cc, 82K, 5%, 1/4W	R20823
R18	Res, cc, 100K, 5%, 1/4W	R20104
R19	Res, cc, 100K, 5%, 1/4W	R20104
R20	Res, cc, 4.7K, 5%, 1/4W	R20472
R21	Pot, trim, pc, min, 1K	R89102
R22	Res, cc, 4.7K, 5%, 1/4W	R20472
R23	Res, cc, 22K, 5%, 1/4W	R20223
R24	Res, cc, 22K, 5%, 1/4W	R20223
R25	Res, cc, 15K, 5%, 1/4W	R20153
R26	Res, cc, 68K, 5%, 1/4W	R20683
R27	Res, cc, 68K, 5%, 1/4W	R20683
R28	Res, cc, 68K, 5%, 1/4W	R20683
R29	Res, cc, 1.5K, 5%, 1/4W	R20152
R30	Res, cc, 47K, 5%, 1/4W	R20473
R31	Res, cc, 47K, 5%, 1/4W	R20473
R32	Res, cc, 4.7K, 5%, 1/4W	R20472
R33	Res, cc, 100K, 5%, 1/4W	R20104
R34	Res, cc, 2.7K, 5%, 1/4W	R20272
R35	Res, cc, 150K, 5%, 1/4W	R20154
R36	Pot, trim, pc, 1K	R88102
R37	Res, cc, 270 ohm, 5%, 1/4w	R20271
R38	Res, cc, 330 ohm, 5%, 1/4W	R20331
R39	Res, cc, 330K, 5%, 1/4W	R20334
R40	Res, cc, 330K, 5%, 1/4W	R20334
R41	Res, cc, 1M, 5%, 1/4W	R20105
R42	Res, cc, 100K, 5%, 1/4W	R20104
R43	Res, cc, 390K, 5%, 1/4W	R20394
R44	Res, cc, 100K, 5%, 1/4W	R20104
R45	Res, cc, 470K, 5%, 1/4W	R20474
R46	Res, cc, 680K, 5%, 1/4w	R20684
R47	Res, cc, 100K, 5%, 1/4W	R20104
R48	Res, metal film, 18.7K, 1%, 1/8W	R11872
R49	Pot, trim, pc, 10K	410183
R50	Res, cc, 2.7K, 5%, 1/4W	R20272
R51	Res, cc, 2.7K, 5%, 1/4W	R20272
R52	Res, cc, 100K, 5%, 1/4W	R20104
R53	Res, cc, 120K, 5%, 1/4W	R20124
R54	Pot, trim, pc, 1K	R88102
R55	Res, cc, 360 ohm, 5%, 1/4W	R25361
R56	Res, cc, 270 ohm, 5%, 1/4W	R20271
R57	Res, cc, 220K, 5%, 1/4W	R20224
R58	Res, cc, 220K, 5%, 1/4W	R20224

REMOTE CONTROL PCB ASSEMBLY (Continued)

REF DESIG	DESCRIPTION	P/N
R59	Res, cc, 1M, 5%, 1/4W	R20105
R60	Res, cc, 100K, 5%, 1/4W	R20104
R61	Res, cc, 390K, 5%, 1/4W	R20394
R62	Res, cc, 100K, 5%, 1/4W	R20104
R63	Res, cc, 470K, 5%, 1/4W	R20474
R64	Res, cc, 680K, 5%, 1/4W	R20684
R65	Res, cc, 100K, 5%, 1/4W	R20104
R66	Res, metal film, 10K, 1%, 1/8W	R11002
R67	Pot, trim, pc, 10K	410183
R68	Res, cc, 2.7K, 5%, 1/4W	R20272
R69	Res, cc, 2.7K, 5%, 1/4W	R20272
R70	Res, cc, 100K, 5%, 1/4W	R20104
R71	Res, cc, 100K, 5%, 1/4W	R20104
R72	Res, cc, 100K, 5%, 1/4W	R20104
R73	Res, cc, 100K, 5%, 1/4W	R20104
R74	Res, cc, 100K, 5%, 1/4W	R20104
R75	Res, cc, 100K, 5%, 1/4W	R20104
R76	Res, cc, 220K, 5%, 1/4W	R20224
R77	Res, cc, 5.6K, 5%, 1/4W	R20562
R78	Res, cc, 5.6K, 5%, 1/4W	R20562
R79	Res, cc, 1K, 5%, 1/4W	R20102
R80	Res, cc, 1K, 5%, 1/4W	R20102
R81	Res, cc, 5.6K, 5%, 1/4W	R20562
R82	Res, cc, 5.6K, 5%, 1/4W	R20562
R83	Res, cc, 22K, 5%, 1/4W	R20223
R84	Res, cc, 47K, 5%, 1/4W	R20473
R85	Res, cc, 10K, 5%, 1/4W	R20103
R86	Res, cc, 22K, 5%, 1/4W	R20223
R87	Res, cc, 2.7K, 5%, 1/4W	R20272
R88	Res, cc, 22K, 5%, 1/4W	R20223
R89	Res, cc, 47K, 5%, 1/4W	R20473
R90	Res, cc, 2.2K, 5%, 1/4W	R20222
R91	Res, cc, 22K, 5%, 1/4W	R20223
R92	Res, cc, 2.7K, 5%, 1/4W	R20272
R93	Res, cc, 22K, 5%, 1/4W	R20223
R94	Res, cc, 47K, 5%, 1/4W	R20473
R95	Res, cc, 4.7K, 5%, 1/4W	R20472
R96	Res, cc, 22K, 5%, 1/4W	R20223
R97	Res, cc, 470K, 5%, 1/4W	R20474
R98	Res, cc, 22K, 5%, 1/4W	R20223
R99	Res, cc, 47K, 5%, 1/4W	R20473
R100	Res, cc, 4.7K, 5%, 1/4W	R20472
R101	Res, cc, 22K, 5%, 1/4W	R20223
R102	Res, cc, 22K, 5%, 1/4W	R20223
R103	Res, cc, 47K, 5%, 1/4W	R20473
R104	Res, cc, 2.2K, 5%, 1/4W	R20222
R105	Res, cc, 22K, 5%, 1/4W	R20223
R106	Res, cc, 2.7K, 5%, 1/4W	R20272
R107	Res, cc, 22K, 5%, 1/4W	R20223
R108	Res, cc, 47K, 5%, 1/4W	R20473
R109	Res, cc, 10K, 5%, 1/4W	R20103
R110	Res, cc, 22K, 5%, 1/4W	R20223
R111	Res, cc, 2.7K, 5%, 1/4W	R20272

REMOTE CONTROL PCB ASSEMBLY (Continued)

REF DESIG	DESCRIPTION	P/N
R112	Res, cc, 150 ohm, 5%, 1/2W	R30151
R113	Res, cc, 5.6K, 5%, 1/4W	R20562
R114	Res, cc, 5.6K, 5%, 1/4W	R20562
R115	Res, cc, 2.7K, 5%, 1/4W	R20272
R116	Res, cc, 100 ohm, 5%, 1/4W	R20101
R117	Res, cc, 100 ohm, 5%, 1/4W	R20101
R118	Res, cc, 100 ohm, 5%, 1/4W	R20101
R119	Res, cc, 100 ohm, 5%, 1/4W	R20101
R120	Res, cc, 100 ohm, 5%, 1/4W	R20101
R121	Res, cc, 100 ohm, 5%, 1/4W	R20101
R122	Res, cc, 100 ohm, 5%, 1/4W	R20101
R123	Res, cc, 100 ohm, 5%, 1/4W	R20101
R124	Res, cc, 220K, 5%, 1/4W	R20224
R125	Res, cc, 5.6K, 5%, 1/4W	R20562
R126	Res, cc, 1K, 5%, 1/4W	R20102
R127	Res, cc, 5.6K, 5%, 1/4W	R20562
R128	Res, cc, 1K, 5%, 1/4W	R20102
R129	Res, cc, 390 ohm, 5%, 1/2W	R30391
S1	Switch, slide, dpdt	S00206
T1	Transformer, audio, hybrid, 600 ohm	T10302
T2	Transformer, audio, hybrid, 600 ohm	T10302
T3	Transformer, 115/230 Vac to 16 Vac CT	T00118
TP1	Pin, test point	E10015
TP2	Pin, test point	E10015
TP3	Pin, test point	E10015
TP4	Pin, test point	E10015
TP5	Pin, test point	E10015
TP6	Pin, test point	E10015
TP7	Pin, test point	E10015
TP8	Pin, test point	E10015
TP9	Pin, test point	E10015
TP10	Pin, test point	E10015
TP11	Pin, test point	E10015
TP12	Pin, test point	E10015
TP13	Pin, test point	E10015
TP14	Pin, test point	E10015
TP15	Pin, test point	E10015
TP16	Pin, test point	E10015
TP17	Pin, test point	E10015
U1	IC, op-amp, 741	U0741T
U2	IC, op-amp, 741	U0741T
U3	IC, quad op-amp, LM249M	402978
U4	IC, op-amp, 741	U0741T
U5	IC, 7-stage binary counter, 4024	U4024E
U6	IC, dual-d, ff, 4013	U4013E
U7	IC, op-amp, 741	U0741T
U8	IC, fsk limiter/detector, 2211	UR2211
U9	IC, op-amp, 741	U0741T
U10	IC, fsk limiter/detector, 2211	UR2211

REMOTE CONTROL PCB ASSEMBLY (Continued)

REF DESIG	DESCRIPTION	P/N
U11	IC, quad, 2-input, nand, 4011	U4011E
U12	IC, quad, 2-input, nand, 4011	U4011E
U13	IC, dual, 4-input, nand, 4012	U4012E
U14	IC, quad, 2-input, nand, 4011	U4011E
U15	IC, quad, 4-input, nand, 4012	U4012E
U16	IC, quad, 2-input, nand, 4011	U4011E
U17	IC, +12V regulator, 7812	U7812T
VR1	Voltage arrestor, T11--22A	VR0003
XU1	Not used	- - -
XU2	Not used	- - -
XU3	IC socket, 14 pin	X00010
XU4	Not used	- - -
XU5	IC socket, 14 pin	X00010
XU6	IC socket, 14 pin	X00010
XU7	Not used	- - -
XU8	IC socket, 14 pin	X00010
XU9	Not used	- - -
XU10	IC socket, 14 pin	X00010
XU11	IC socket, 14 pin	X00010
XU12	IC socket, 14 pin	X00010
XU13	IC socket, 14 pin	X00010
XU14	IC socket, 14 pin	X00010
XU15	IC socket, 14 pin	X00010
XU16	IC socket, 14 pin	X00010

ADDENDUM

SINGLE UNIT INTERFACE ASSEMBLY 1A5

1.0 GENERAL.

The Single Unit Interface Assembly 1A5 in a single transmitter system prevents inadvertant attempts by the remote control unit transfer circuitry to transfer antenna connection to a secondary transmitter not present in a single system. The single unit interface assembly is installed on the rear of the SR-402RA Remote Control Unit in single transmitter systems only. Connector Pl of the interface unit connects directly to connector Jl on the remote control unit rear panel.

2.0 THEORY OF OPERATION.

Dual transmitter systems which have two transmitters are equipped with an antenna transfer assembly. The antenna transfer assembly provides a means of switching the antenna system to either a primary or secondary transmitter depending on control signals provided to it from the system remote control units. The single unit interface assembly replaces the antenna transfer assembly in single transmitter systems. Its purpose is to prevent inadvertant attempts to transfer to a secondary transmitter which is not present in a single transmitter system.

The transfer function is initiated by a combination of tones generated within the remote control unit which in turn generate signals causing an antenna transfer relay in the transfer assembly to switch. The operation of the transfer circuits in the remote control unit is described fully in A377-4A. The schematic diagram of the single unit interface assembly is shown in figure 1. If the transfer circuits are activated by inadvertant application of transfer tones in a single transmitter system, the output of the remote control unit at J2-20 will be applied to the single unit interface assembly. This signal at. J2-20 will cause the interface assembly to momentarily interrupt power to remote control unit relay AlK1. Loss of power at AlKl initiates a power-on reset condition. At power-on a pulse is applied. to the R input of flip-flop AlU6A returning it to the secondary (reset) state which is the normal state for single transmitter systems. Since the remote control unit connection J2-8 (“S” contact line) in single systems is permanently grounded via the interface assembly, the transmitter is enabled and normal operation is maintained.

3.0 COMPONENT LOCATIONS AND PARTS LISTS.

The component locations for the single unit interface assembly and the single unit interface pc board assembly are shown in figures 2 and 3 respectively. The parts lists follow at the end of this chapter.

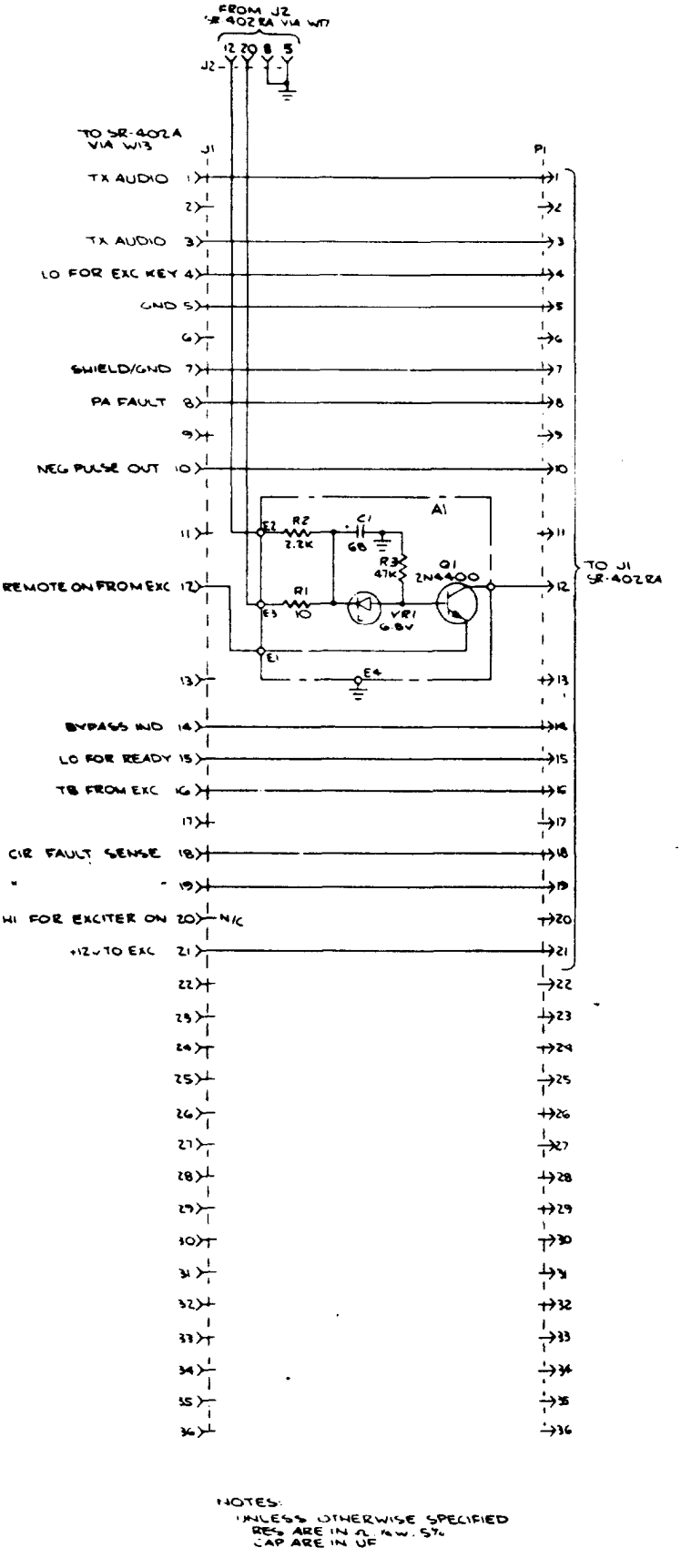

Figure 1. Single Unit Interface Assembly, Schematic Diagram

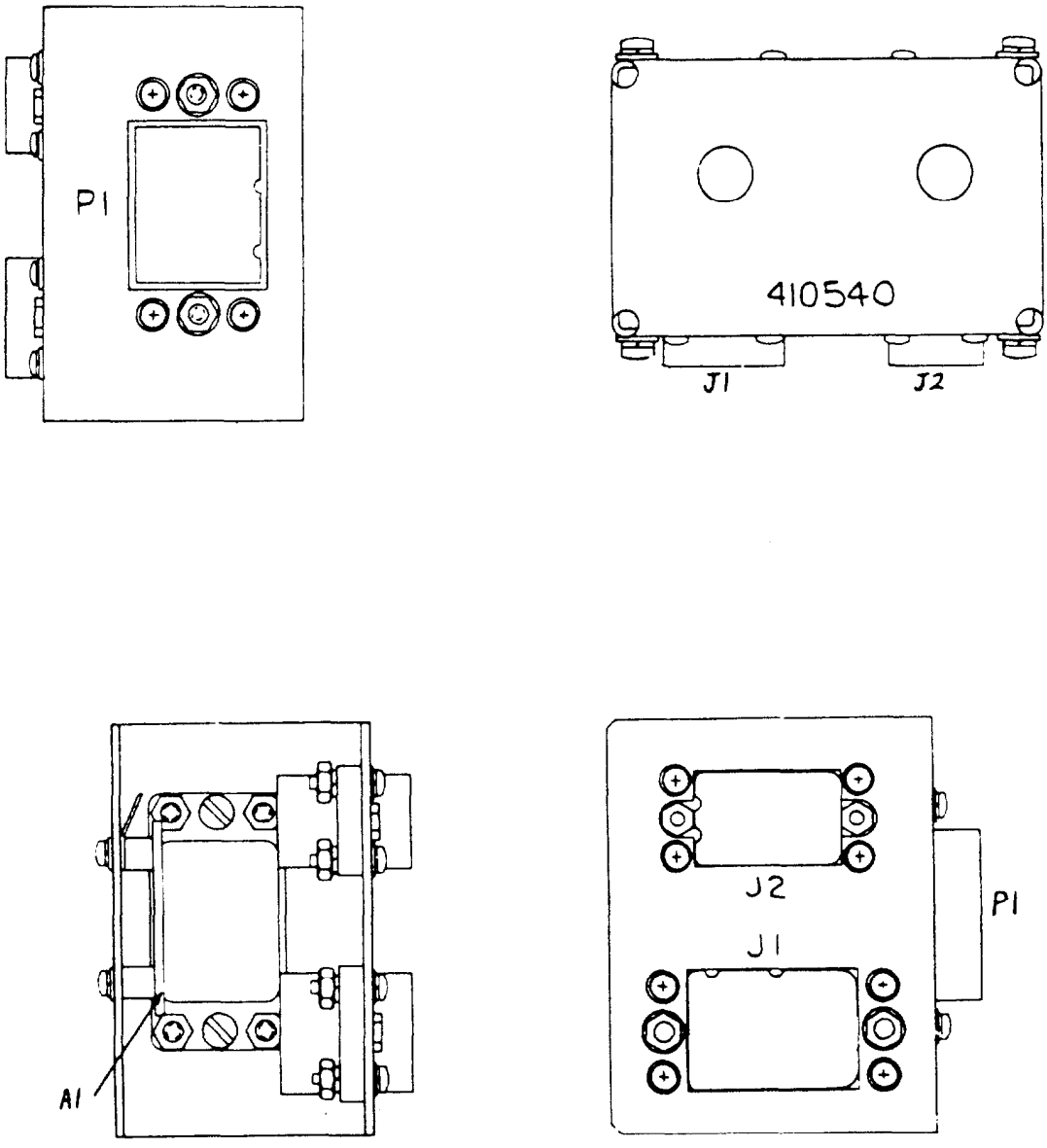

Figure 2. Single Unit Interface Assembly, Component Locations

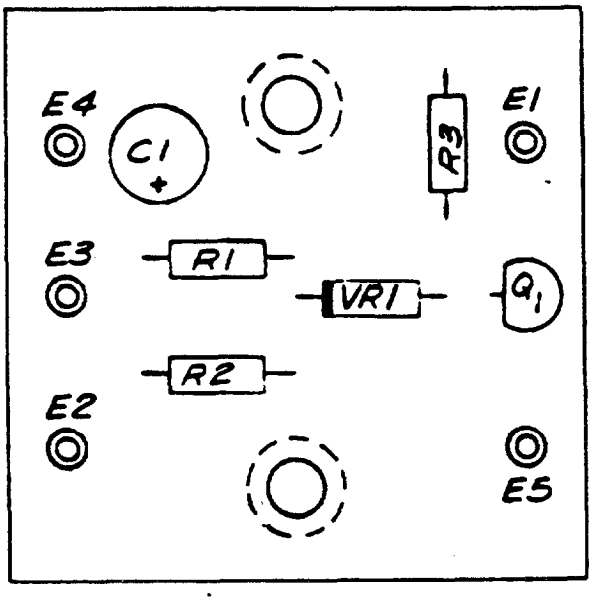

Figure 3. Single Unit Interface PC Board Assembly, Component Locations

SINGLE UNIT INTERFACE ASSEMBLY 1A5

REF DESIG	DESCRIPTION	P/N
---	SINGLE UNIT INTERFACE ASSEMBLY	410540
A1	Single Unit Interface PCB Assembly	410535
J1	Connector, 36 pin female	500253
J2	Connector, 23 pin female	500257
P1	Connector, 36 pin male	P00253
	Jackscrew assembly	PM0001

SINGLE UNIT INTERFACE PCB ASSEMBLY lA5Al

REF DESIG	DESCRIPTION	P/N
---	SINGLE UNIT INTERFACE PCB ASSEMBLY	410535
C l	Cap, tant, 68uF	C46863
Q1	Transistor, npn, 2N 4400	Q44000
R l	Res, comp, 10 Ω , 5%, 1/4W	R20100
R2	Res, comp, 2.2K, 5%, 1/4W	R20222
R3	Res, comp, 47K, 5%, 1/4W	R20473
VR l	Diode, zener, 6.8V, lN754A	VR7540